The Monthly Evening Sky Map

A JOURNAL FOR THE AMATEUR — FOUNDED BY THE LATE LEON BARRITT
— NORTHERN AND SOUTHERN HEMISPHERE —

ALSO A STAR, CONSTELLATION AND PLANET FINDER MAP ARRANGED FOR THE CURRENT MONTHS - JAN. - FEB. - MAR. MORNING AND EVENING - AND PRACTICALLY ANYWHERE IN THE WORLD **PUBLISHED QUARTERLY**

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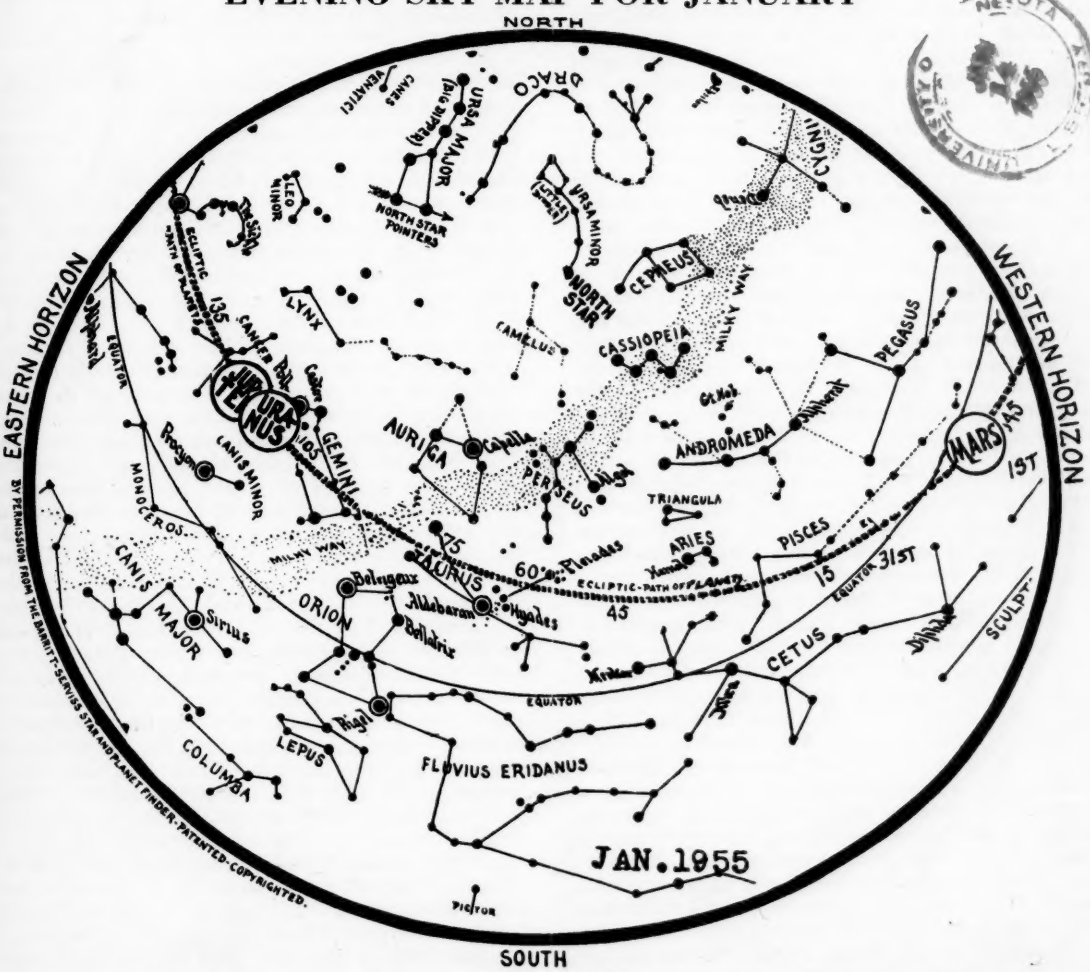
EVENING SKY MAP FOR JANUARY



AT 9:00 P.M., JAN. 1 8:00 P.M., JAN. 15 7:00 P.M., JAN. 31

Face South and Hold the Map Overhead. The Top North and You Will See the Stars and Planets Just as They Appear in the Heavens. The Arrow Through the Two Stars in the Bowl of the Big Dipper Points to the North Star. The Star at the End of the Little Dipper.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or South of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

THE NEAREST NEIGHBORS OF THE GALAXY

By A. C. GIFFORD, M.A., F.R.A.S.

Our sun is one of hundreds of thousands of millions of stars in one particular stellar system that we call the Galaxy. The stars in it are not arranged with any approach to uniformity, but are gathered into clusters and star clouds. It is, however, almost certain that the whole system if seen from without would have a very beautiful characteristics shape, that is hidden from us we view it, of necessity, only from within. Herschel's researches showed that the system is very much flattened. This conclusion has been abundantly confirmed in recent years. Methods have been found for estimating distances which even light would take millions of years to cross. Stars of every type, planetary and diffuse nebulae and obscuring clouds of dark matter, are all found to be contained in a space whose shape is often compared with that of a very flat watch. Associated with this system are about a hundred globular clusters. These are arranged in a system which has about the same center as the Milky Way, but which is less flattened. The stellar system probably extends at least six or eight times as far in the galactic plane as at right angles to it. The system of the globular clusters extends about as widely as that of the stars. Shapley mentions two clusters N.G.C. 7006 and 2298 which are 260,000 light years apart. But at right angles to the galactic plane clusters are found up to 65,000 light years. Now what lies beyond? The Galaxy is not nearly as isolated from similar cosmic systems as our solar system is from other stars. No other star has been found within 28 million diameters from the sun. But it would be possible to represent the Galaxy and four or five other systems in a single diagram drawn to scale, if we knew the distances and dimensions more exactly. We have seen that the tendency just at present is to diminish the estimates made a few years ago of the size of the Galaxy and, at the same time, to increase those of the nearest spirals. For the sake of an illustration let us use intermediate values. Suppose the diameter of the Galaxy is taken as 200,000 light years and its thickness 30,000 light years. Then a few globular clusters will be found, three or four times as far away from the galactic plane as the star clouds. Surrounding this vast region is a comparatively vacant space, before we come to some other interesting systems. The plane containing the earth's orbit round the sun is tilted at an angle of about 62 degrees to the galactic plane. Thus the bright band of the Milky Way passes through Perseus, Cassiopeia and Lacerta within about thirty degrees of the North Pole and through Carina, Crux, and Ara at about the same distance from the south one. It happens that the nearest neighbors of the Galaxy are all to the south of it. Some of these are extremely close to us in comparison with the distances of many objects that can now be observed or photographed with great telescopes, but even they are a long way off when measured with terrestrial standards. The two nearest are always well above our horizon, and can be studied during any clear night. We call them the Magellanic Clouds. We do not see them as they are now, but as they were nearly a hundred thousand years ago. Their distance used to be given as 102 and 112 thousand light years respectively. But from a study of the Cepheid variables in them Shapley deduces a distance of only 86,000 light years for the Large Cloud and 95,000 light years for the small one. With these values it would take light 10,800 years to cross from one side to the other of the Large Cloud, 6000 years to pass through the Small Cloud, and about 40,000 years to travel from one cloud to the other. The next nearest known system is an irregular star cloud N.G.C. 6822 in Sagittarius, at a distance of 700,000 light years. Then in the Northern Hemisphere of the sky, but still south of the Galaxy, are the two nearest of the known Spiral Nebulae, viz.: the Great Nebula in Andromeda, and the beautiful one in Triangulum. These are believed to be each about 900,000 or a million light years away, and to have diameters of about 65,000 and 30,000 light years respectively. These two spirals give a good idea of what is believed to be the constitution of the Galaxy. The Great Nebula of Andromeda we see obliquely, that in the Triangle broadside on. The former seems to have a brighter central cloud than anything in our Galaxy, but a small nebula looks as if it bears about the same relation to the great nebula that the Small Magellanic Cloud does to the Galaxy. M.33, the nebula in the Triangle, probably resembles our system still more closely except in size.

It is strange how opinions have varied with regard to the status of the spirals. In 1785 Sir William Herschel stated his belief that many of the nebula are external galaxies. In 1786 he remarked that he had discovered 1500 "universities." But in 1791 he found a star in Taurus surrounded by nebulosity that was not at all of a starry nature, and spoke of a shining fluid of a nature totally unknown to us. He thus recognized that the one word nebula was used to describe very different objects. In 1845 Lord Rosse made many discoveries with his 6-foot reflector, which for a great many years was the largest telescope in existence. He was the first to detect the spiral form in what is now known as the Whirlpool Nebula in the Hunting Dogs. He thought he was able to resolve into stars many nebulae, some of which are now known to be gaseous. A certain proof of the existence of gaseous nebulae was found by Huggins in 1864, when he turned his spectroscope on to a bright planetary nebula in Draco. During the next four years he examined the spectra of seventy nebulae. He found that the nebula in Andromeda, the Whirlpool nebula, and many others, as well as all the globular clusters, gave continuous spectra like those of stars. The extra-galactic nebulae are thus clearly differentiated from the planetary and the diffuse galactic nebula. The former are indeed cosmic systems similar in nature to the Galaxy itself. It is very surprising to find the contrary view upheld, in a book only forty years old. "A Century's Progress in Astronomy," by Hector Macpherson, was published in 1906. In this we find the belief in the existence of other galaxies beyond the Milky Way, referred to rather scornfully, as the following quotations will show: "Herschel's earlier idea that the nebulae were external galaxies was long held by the majority of astronomers in preference to his later and more advanced ideas." "It was clearly shown by William Whewell and by Herbert Spencer that the systematic distribution of the nebulae in regard to the stars precluded the possibility of their being external galaxies." "Proctor was not so fortunate in theorizing as in direct investigation. He thought that the Magellanic Clouds were probably external galaxies; and, further, he put forward the idea that the Milky Way is a spiral. . . . But neither of these ideas has found favor with astronomers." "But the chief work accomplished by Proctor was a revision of our knowledge of the universe which he thus describes: 'Within one and the same region coexist stars of many orders of real magnitude, the greatest being thousands of times larger than the least. All the nebulae hitherto discovered, whether gaseous or stellar, irregular planetary, ring formed or elliptic, exist within the limits of

the Sidereal System.'" Later on Macpherson says: "The nebular theory modified by subsequent research, seems destined to hold its own against all attacks."

The improvement of the telescope, the application of photography to astronomy, and the development of spectroscopic methods of research having changed all this. Portions of many spiral nebulae have been resolved into clouds of stars. Star clusters and variable stars, as well as gaseous nebulae, have been found within them. Distances are now estimated with gradually increasing accuracy, by many indirect methods, amongst which the most powerful depends on the study of Cepheid variables. Fresh discoveries may at any time change the details of the picture, but it seems certain that our Galaxy, gigantic as it is, forms but one unit in a much vaster assembly of cosmic systems. The hundred inch telescope is unable to sound the depths of this enormous gathering of "Worlds Without End," to use the happy title given to his last work by the Astronomer Royal. The Magellanic Clouds lead us towards Andromeda and The Whirlpool, and other forms entice us on until we find innumerable specks on many a photographic plate, which tell of galaxies a hundred million light years away.

THE GREAT NEBULA IN ANDROMEDA

About ten times as far away from us the the two Magellanic Clouds are the two nearest of the systems that are at all comparable with our Milky Way in status. The larger and brighter of these two is sometimes referred to as M.31, but is usually known by the title given above, which though so familiar is doubly misleading. Inconspecuous as the object is to the naked eye it is in reality a galaxy rather than a little cloud, and though it appears amongst the stars of the consellation, it certainly is not "in" Andromeda. The name of the beautiful daughter of King Cepheus and Cassiopeia was given by the Greeks to a group of stars south of the main stream of the Milky Way, but in the Northern Hemisphere of the sky. Adjacent groups were named after Cephus and Cassiopeia and another after Perseus, who rescued and married the heroine. The story tells that Cassiopeia, Queen of Ethiopeia, offended Poseidon by claiming to be as beautiful as his daughters the Nereids. A sea monster was sent to destroy man and beast, and the Oracle announced that the only possibility of escape lay in the sacrifice of Andromeda. She wa schained to a rock to await her fate, but Perseus arrived opportunely, slew the monster, and carried off his bride to Argos. The constellation Andromeda extends from 20 to 53 degrees in N. declination. The Great Nebula is nearly 41 degrees north of the equator. It rises therefore only about 7½ degrees above our horizon. To find it look out during the early evening in spring or early summer. Start from the great square of Pegasus. The bottom right-hand corner of this square, as we see it, is Alpha Andromedae, magnitude 2.2. Stretching downwards towards the right in a curved line for nearly 30 degrees from Alpha, we see Delta 3.5, Beta 2.4, and Gamma 2.3. From Beta, Mu and Nu lead the eye down six degrees towards the left. Then little more than one degree further to the left is the Great Nebula. The constellation Andromeda is thus the window through which we must look to see the distant nebula, From any station on a planet within the great nebula itself the constellation Andromeda would be quite invisible. We often have a somewhat similar experience on a small scale. A distant mountain may be seen through one side of our windows, whilst the window is invisible from the mountain. The Franz Joseph Glacier is framed most perfectly by one particular window, but Mount Egmont can be seen through innumerable ones, some a hundred miles away. Now the stars of Andromeda all belong to our local cluster, the distances of Alpha, Beta, Gamma, and Delta are given as 81, 74, 217, and 116 light years respectively. Gamma is sometimes called the finest binary in the heavens, a yellow star with a blue-green companion. Now we have seen that the Magellanic Clouds are more than a thousand times as far away as Alpha and Beta Andromedae. But the distance of the Great Nebula is ten times as great again. It is clear then that the nebula, in this case, has nothing whatever to do with the stars of the constellation, except that, seen from the earth, it is in much the same direction. Diffuse galactic nebulae, on the other hand, are generally closely connected with particular stars. The dust clouds about the Pleiades that show so marvellously in photographs of the cluster are illuminated by the individual stars, and the Great Nebula in Orion is enabled to shine so brilliantly by the excitation it receives from the ultra-violet radiation of Theta and other stars.

But how do we know that the Great Nebula in Andromeda, and millions of others, are really galaxies and not simply clouds in their own? Though believed by many since the time of Sir William Herschel, this fact has become indisputable only within the last quarter of a century or so. When Lord Rosse's six-foot mirror resolved cloud after cloud in stars, there was a tendency to think that all would ultimately be resolved. But when Huggins, with the spectroscope, proved the existence of gaseous clouds, there was a reaction. Herschel had realized that so-called nebulae are of very different kinds. But it was found that planetary and diffuse nebulae are almost confined to the Milky Way, whilst the spirals avoid it. They are found in great numbers on each side of the streams; but they are very scarce within twenty degrees of the galactic equator, and completely absent from a narrower zone along its course. For a time many argued that this pecular distribution proved that the nebulae were all members of the galactic system. But as instrumental aid increased in efficiency it became more and more evident that the distances of these systems are immense. The two Magellanic clouds were found to be just like portions of the galaxy though completely separated from it. Stars and nebulae are intermingled in them as they are in the Galaxy itself. Globular clusters are also associated with them. Strange to say the Great Magellanic Cloud, though so much smaller than the Galaxy, contains the brightest known star, and the greatest gaseous nebulae. The star S Doradus is estimated to give at least 300,000 times as much radiation as our sun, and the gaseous nebula 30 Doradus is said to have a diameter of about 560 light years. Now the Grand Nebula of Orion has a total diameter of about 15 light years only. It surrounds the wonderful group of giant suns known as Theta Orionis, the central gem of the Dagger. Now Theta is about 650 light years from us, but most of the stars in Orion are much nearer. The distances of Alpha, Beta, Gamma, and Delta are given as 272, 543, 192, and 362 light years. So we may say that 30 Doradus is large enough to extend from here so as to envelop the greater part of the constellation of Orion. But the estimates of size all depend on those of distance, and, we have seen, direct measurement, by trigonometrical methods, is only possible within our local cluster. For distances greater than a thousand light years, the probable error exceeds the quantity to be measured. Fortunately many indirect meth-

Continued on Page five

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MRS. LEON BARRITT, Editor
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Irving L. Meyer
Please make checks payable to "The Monthly Evening Sky Map"

Box 3, Pike County, Shohola, Pa.
Telephone Milford 2310

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AMATEUR'S FORUM

By IRVING L. MEYER, M.S.

JANUARY 1955

THE SUN: is found in Sagittarius, deep in the southern heavens, on the first of the month. It moves north-eastwardly into Capricornus. It is closest to the earth the 4th at 91.4 million miles.

THE MOON: is closest to the earth (perigee) the 6th at 226,000 miles, and is farthest from the earth (apogee) the 17th at 252,000 miles.

The Moon's Phases (E.S.T.):

First quarter	January	1 at	3:29 PM
Full Moon		8 at	7:44 AM
Last quarter		15 at	5:13 PM
New Moon		23 at	8:06 PM
First quarter		31 at	12:05 AM

MERCURY: spends the entire month in the evening sky, reaching greatest elongation east of the Sun, 18° 26′, on the 28th. For a few days before and after this date Mercury will be observable as a bright star (magnitude —0.3) very low in the west in the twilight. In the telescope this planet will appear like the Moon at quarter phase. On the first of the month it is in Sagittarius, 132 million miles away; by the 31st distance has decreased to 83 million miles, and it has moved through Capricornus to a point on the Aquarius border.

VENUS: is very well placed for observation in the morning sky. It travels from Libra through Scorpio to a point in southern Ophiuchus. It reaches greatest elongation west of the Sun, 46° 57′, on the 25th. The brightest object in the skies (next to the Sun and Moon), we find on the 1st: magnitude —4.3, distance 45 million miles, diameter 34″, and appearing as a crescent in the telescope; on the 31st, magnitude is —4.0, distance 66 million miles, diameter 24″, and a slightly gibbous appearance in the telescope. Can be seen in broad daylight with the unaided eye.

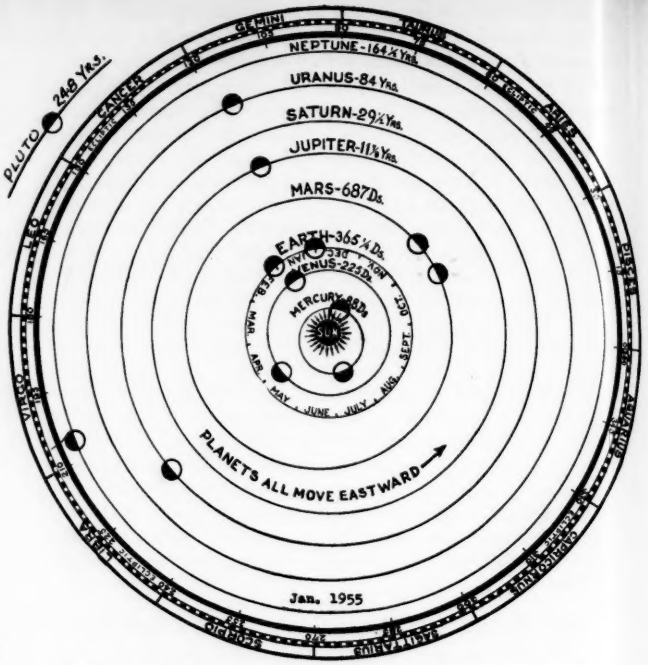
MARS: crosses from the southern hemisphere into the northern, as it moves from Aquarius into Pisces. Shining with a brightness equivalent to that of a first magnitude star, it sets only a few hours after the Sun. In the telescope its 6″ diameter disc can be made out with moderate magnification, and will appear somewhat gibbous (like the Moon about three days from full). Distance is increasing continually: from 133 million miles the 1st, to 155 million miles the 31st.

JUPITER: on the Gemini-Cancer boundary, is very well placed for observation, as it comes to opposition the 15th and will, therefor, remain above the horizon the entire night. It is closest to the earth on this same date, at 395 million miles, and will then be of magnitude —2.2. Its equatorial diameter will be 46.3″ and its polar diameter 43.2″, resulting in a pronounced elliptical appearance as seen with the most moderate telescopic aid. A magnification of 50 diameters will reveal the dark bands across the disc and parallel to the equator. Also, the four brightest satellites can be seen with opera glasses.

SATURN: in central Libra, is a morning star, rising after midnight. It is a bright planet, but will be better placed for observation in the Spring. On the 15th, it is 953 million miles away. The famous ring system is pretty widely open as seen from the earth, and can be examined with moderate telescopic power.

URANUS: is close to Jupiter, high in the northern heavens, in Gemini. It comes to opposition the 16th, and, like Jupiter, will be observable throughout the entire night. It is closest to the earth the 16th at 1640 million miles. This great distance results in an apparent diameter of 3.9″. With magnification of 50 diameters, a neat greenish disc is readily apparent. On a clear, moonless night Uranus can be seen with the unaided eye. On the 6th observers will have a good chance to locate this planet, as it then will be 9′ (or about one-third of the apparent lunar diameter) north of Jupiter.

NEPTUNE: in Virgo, is pretty well placed for observation, as it rises at about midnight. However, it is a faint, 8th magnitude object, and can only be seen with good optical aid. Distance the 1st is 2821 million miles.



Orbits and Heliocentric Movements of the Planets for January

NOTE: The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month, are given for Mercury, Venus and Mars. The arrow indicates the last day of the month, Jupiter, Saturn, Uranus and Neptune are shown in the mean position for the current month.

PLANETARY CONFIGURATIONS

Eastern Standard Time

JANUARY 1955

Jan.	2—	3:	PM	Venus in perihelion
	4—	7:	AM	Earth in perihelion
	6—	1:	PM	Conjunction, Jupiter and Uranus; Jupiter south 0° 9′
	8—	3:	PM	Mercury greatest heliocentric latitude south
	8—	10:21	PM	Conjunction, Jupiter and Moon; Jupiter north 2° 18′
	8—	10:43	PM	Conjunction, Uranus and Moon; Uranus north 2° 28′
	15—	3:	PM	Opposition, Jupiter and Sun
	16—	4:34	AM	Conjunction, Neptune and Moon; Neptune north 6° 56′
	16—	9:	AM	Opposition, Uranus and Sun
	17—	10:25	PM	Conjunction, Saturn and Moon; Saturn north 6° 8′
	18—	9:	PM	Quadrature, Neptune and Sun
	19—	6:38	PM	Conjunction, Venus and Moon; Venus north 5° 53′
	24—	11:	AM	Venus greatest heliocentric latitude north
	25—	10:	AM	Venus greatest elongation west, 46° 57′
	25—	11:20	AM	Conjunction, Mercury and Moon; Mercury south 4° 42′
	27—	4:	PM	Mercury in ascending node
	28—	3:	AM	Mercury greatest elongation east, 18° 26′
	28—	11:37	PM	Conjunction, Mars and Moon; Mars south 5° 42′
	30—	8:	AM	Neptune stationary in Right Ascension

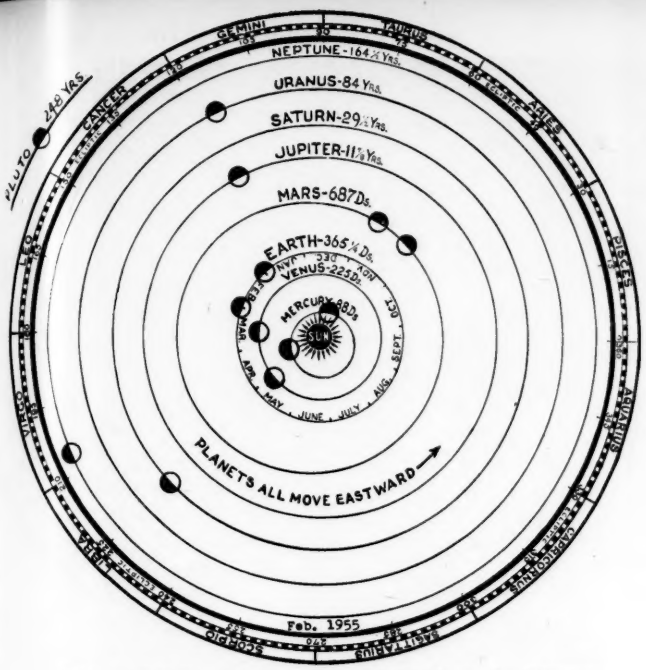
AMATEUR'S FORUM

By IRVING L. MEYER, M.S.

FEBRUARY 1955

THE SUN: moves from Capricornus into Aquarius this month, still in the southern hemisphere. Distance increases slightly, from 91.5 to 92.0 million miles.

THE MOON: is closest to the earth twice this month—on the 2nd at 229,000 miles and on the 27th at the same distance; it is farthest the 14th at 251,000 miles.



Orbits and Heliocentric Movements of the Planets for February

The Moon's Phases (E. S. T.):

Full Moon	February	6 at	8:43 PM
Last quarter		14 at	2:40 PM
New Moon		22 at	10:54 AM

Note the unusual circumstances of only three phases of the Moon this month.

MERCURY: scurries from Aquarius into Capriconus during the month. An evening star until the 12th (upon which date it is in inferior conjunction with the Sun), this elusive planet can be seen just after sunset in the western twilight zone for the first few days of the month. After the 12th it appears in the morning sky, and is too close to the Sun to be observable. It is closest to the earth the 15th at 60 million miles .

VENUS: mover from Ophiuchus through Sagittarius to the boundary of Capricornus. It is well placed for observation in the morning sky the entire month. Distance from the earth, increasing from 67 to 86 million miles during the month, reduces the apparent diameter from 23″ to 18″ but has little effect on brightness. In the telescope Venus begins the month appearing much like the quarter Moon, but by the end of the month will appear distinctly gibbous.

MARS: now a relatively insignificant object in the early evening sky, sets shortly after the Sun. It moves from Pisces into Aries, at geocentric distances increasing from 156 million miles the 1st to 175 million miles the 28th. Not well placed for observation.

JUPITER: rides high in Gemini, setting shortly before dawn. A brilliant object (second in brightness only to Venus), its 45″ diameter disc can be made out readily with opera glasses. With a small telescope the daily (even hourly) changes in the positions of the four major satellites can be detected easily; with greater magnification their transits and eclipses can be watched. Distance the middle of the month is 409 million miles.

SATURN: rises around midnight from a point in central Libra. A bright planet, it is one of the most interesting sights to be seen with the telescope. Daily it is becoming better situated for observation. On the 15th, distance is 906 million miles, ring diameter is 39″, and magnitude is 0.7.

URANUS: also high in the northern skies in Gemini is, like Jupiter, above the horizon most of the night. However, Uranus is a faint planet shining at about magnitude 6, making it just visible to the naked eye under favorable observing conditions. Distance the 15th is 1652 million miles.

NEPTUNE: is a few degrees northeast of Spica in Virgo. This great planet is more remote than Uranus, and fainter by some five or six times, putting it at magnitude 8, beyond the range of the unaided eye. It rises well before midnight, being only about two months until opposition. Distance the 15th is 2773 million miles; its apparent diameter then is 2½″.

PLUTO: this dimmest and most remote of the major planets comes to opposition the 14th in Leo. Though well placed for observation, it cannot be seen without the help of a sizeable telescope and the use of detailed star charts to enable it to be distinguished from the many faint stars in the area. Distance the 14th (closest approach to the earth) is 3264 million miles.

PLANETARY CONFIGURATIONS

Eastern Standard Time

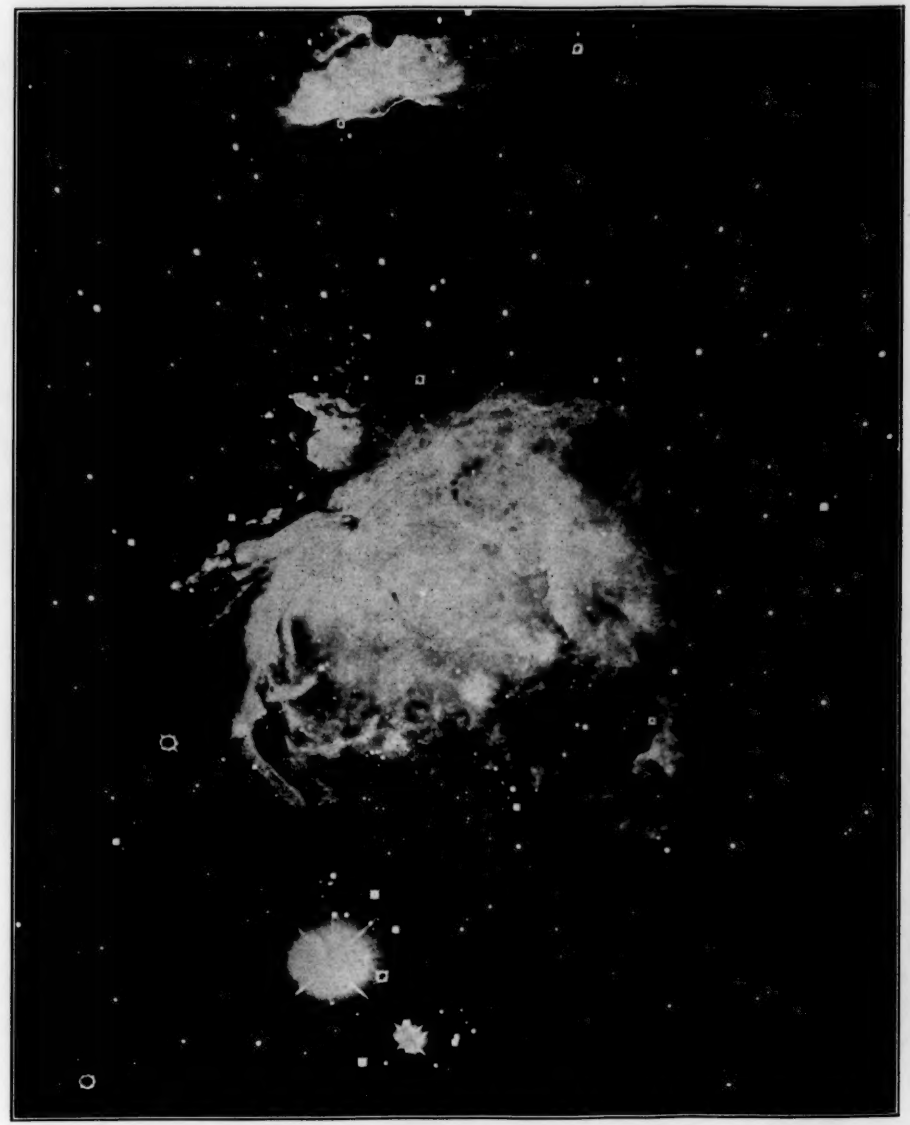
FEBRUARY 1955

Feb.	1— 7:	AM	Mercury in perihelion
	3— 2:	AM	Mercury stationary in Right Ascension
	3— 8:	AM	Mars in ascending node
	5— 1:54	AM	Conjunction, Jupiter and Moon; Jupiter north 2° 3′
	5— 6:21	AM	Conjunction, Uranus and Moon; Uranus north 2° 23′
	10— 4:	AM	Quadriture, Saturn and Sun
	11— 1:	PM	Mercury greatest heliocentric latitude north
	12—12:50	PM	Conjunction, Neptune and Moon; Neptune north 6° 47′
	12— 2:	PM	Inferior conjunction, Mercury and Sun; Mercury north 3° 41′
	14— 8:58	AM	Conjunction, Saturn and Moon; Saturn north 5° 58′
	14— 8:	PM	Opposition, Pluto and Sun
	18— 3:58	PM	Conjpnction, Venus and Sun; Venus north 1° 18′
	21— 3:09	AM	Conjunction, Mercury and Moon; Mercury south 0° 29′
	24— 3:	PM	Mercury stationary in Right Ascension
	26— 2:51	PM	Conjunction, Mars and Moon; Mars south south 4° 24′

THE NEAREST NEIGHBORS OF THE GALAXY

Continued from Page Three

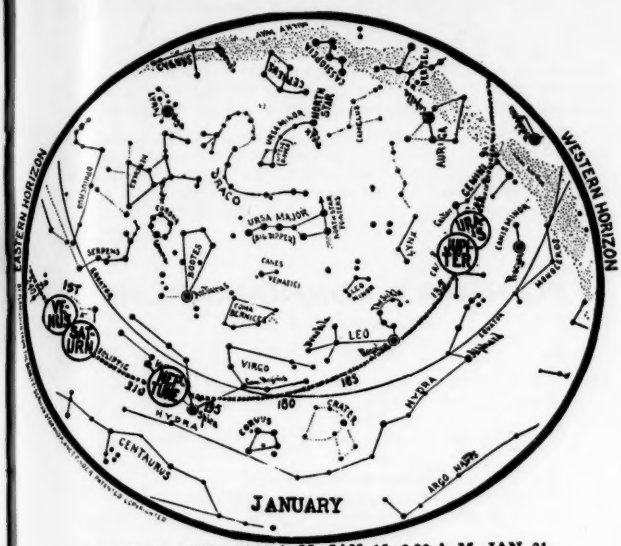
ods have been found which lead to consisted results. We have discussed many of those very fully, and it will be sufficient to mention again that Cepheid Variables and Novae have been discovered in many extra galactic systems. These enable estimates to be formed of the distances of the systems in which they occur, and these estimates are confirmed in many other ways. Most of the extra-galactic nebulae are so far away that they appear extremely small. The Great Nebula in Andromeda is a giant amongst them. With the naked eye we see only its central nucleus which corresponds in that system to the star cloud of Sagittarius in ours. Long exposure photographs taken with giant telescopes show that its diameter is about three degrees; that is nearly six times the apparent diameter of the moon, the mean value of which is 31 minutes 5 seconds. The next largest is M. 33 in the Triangle, with a diameter of about one degree. Connecting links between the Galaxy and these two vast systems are the Magellanic Clouds, N.G.C. 6822 in Sagittarius, M. 82 and N.G.C. 4449. We must remember that the star images scattered over the whole picture represent stars in the constellation Andromeda. They are only a few hundred light years away. The nebula can be seen shining through this screen of stars. When photographs, taken with the same instrument on different dates, are studied with the blink microscope, a device by which the two views of the field can be seen alternatively in rapid succession, the stars which shine with a steady light appear unchanged, the variables flicker and are thus discovered. Photographs are then taken at intervals to determine their periods. The period-luminosity law for the Cepheids is then applied in determining the distances. M. 31, or the Great Nebula in Andromeda, and M. 33 in the Triangle are found to be between 870,000 and 900,000 and N.G.C. 6822 700,000 light years from us. With these values the diameters of the systems must be 47,000, 16,000, and 4000 light years respectively.



THE GREAT NEBULA IN ORION
Photo by W. G. Ritchey at The Yerkes Observatory

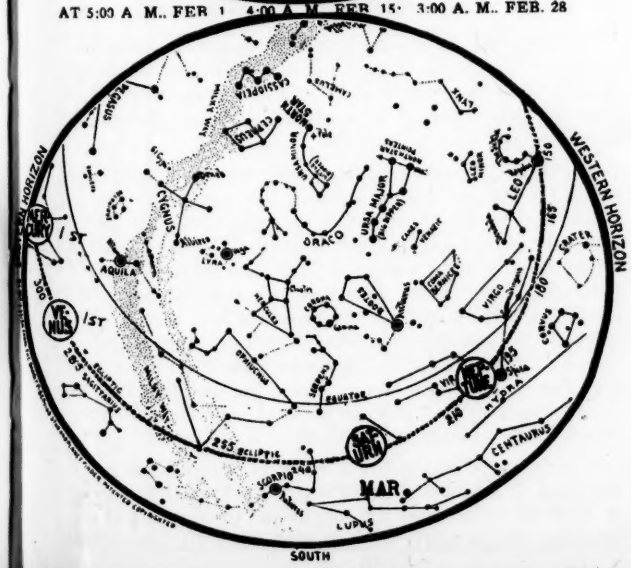
The Monthly Evening Sky Map

MORNING SKIES FOR JAN.-FEB.-MARCH, 1955



AT 5.00 A. M., JAN. 1; 4.00 A. M., JAN. 15; 3.00 A. M., JAN. 31

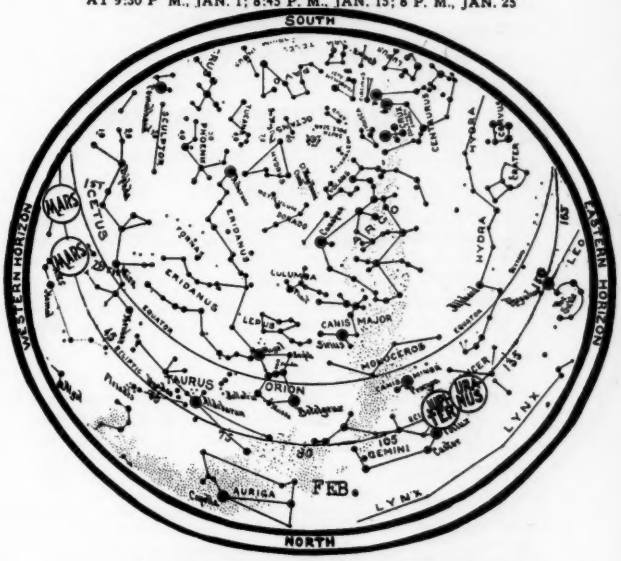
AT 5:00 A M., FEB 1 4:00 A M. FEB 15 3:00 A. M., FEB. 28



AT 5:15 A. M. MARCH 1; 4:15 A. M. MARCH 15; 3:15 A. M. MARCH 31

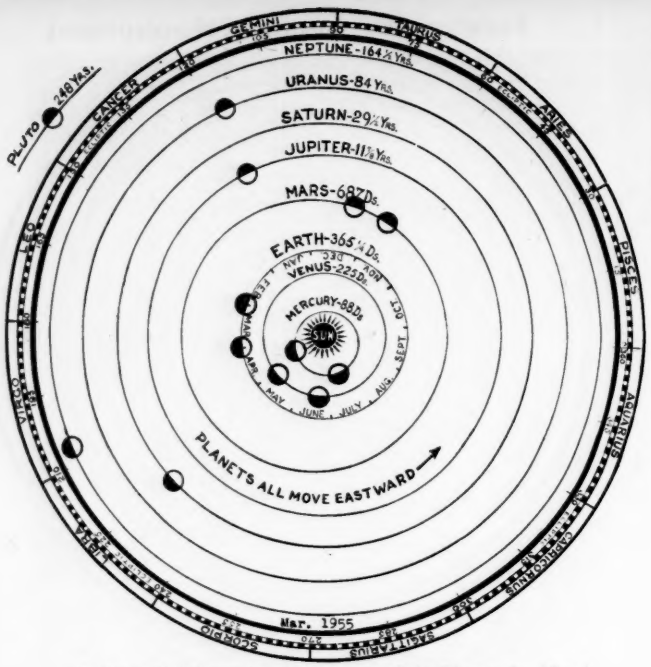
Evening Sky Southern Hemispheres

AT 9:30 P M., JAN. 1; 8:45 P. M., JAN. 15; 8 P. M., JAN. 25



AT 9:15 P M. FEB. 1, 8:30 P.M. FEB. 10; 7:45 P M. FEB. 21

AT 8:45 P M. MAR 1; 7:45 P M. MAR. 15; 6:45 P.M MAR. 31



Orbits and Heliocentric Movements of the Planets for March

AMATEUR'S FORUM

By IRVING L. MEYER, M.S.

MARCH 1955

THE SUN: crosses the equator into the northern hemisphere this month. It travels from Aquarius into Pisces, at distances from the earth of 92.0 million miles the 1st, increasing to 92.8 million miles the 31st.

THE MOON: is at apogee (farthest from the earth) the 14th at 251,000 miles, and is at perigee (closest to the earth) the 26th at 226,000 miles.

The Moon's Phases (E. S. T.):

First quarter	March	1 at	7:40 AM
Full Moon		8 at	10:41 AM
Last quarter		16 at	11:36 AM
New Moon		23 at	10:42 PM
Full Moon		30 at	3:10 PM

MERCURY: in the morning sky, moves from Capricornus into Aquarius. On the 10th it is at greatest elongation west of the Sun (27° 27′) and for about a week around this date will be visible close to the eastern horizon just before sunrise. Magnitude will be 0.4, and, as seen in the telescope, it will be about half illuminated. The disc of the planet can be seen with moderate magnification (apparent diameter 7″) and if setting circles are available, this planet can best be observed in broad daylight. Distance the 1st is 73 million miles, and on the 31st, 111 million miles.

VENUS: is also in the morning sky. A much brighter planet than Mercury, its elongations also are about twice as great as those of Mercury, enabling one to observe Venus under much better conditions. It moves through Capricornus into Aquarius and is well placed for observation. Magnitude averages —3.6; the disc about 70% illuminated, making it appear gibbous in the telescope. Distance is increasing—this month, from 87 million miles the 1st, to 106 million miles the 31st.

MARS: moves from Aries to a point close to the Pleiades in Taurus. It is in the evening sky, but getting more distant and fainter, and sets early in the evening. Distance the 1st is 176 million miles, against 197 million miles the 31st. Its great distance has reduced its apparent diameter to the point that it appears only slightly larger in the telescope than Uranus.

JUPITER: is still well situated in Gemini in the evening sky, setting well after midnight. This largest of all the planets is one of the most interesting; opera glasses will reveal its disc and brighter satellites, and a small telescope will show the polar flattening and cloud bands across the disc. Distance the 15th is 441 million miles, magnitude is —2.0, and equatorial diameter 41″.

SATURN: in Libra is still technically a morning star, but arrives on the scene well before midnight. Brighter than a standard first magnitude star, it well repays telescopic study. Its unique ring system is widely opened, and moderate power will reveal Cassini's division. Distance the 15th is 865 million miles.

URANUS: is well placed in Gemini in the evening sky. A magnification of 50 or 100 diameters will reveal a neat, round, greenish disc. To the naked eye or in binoculars it is an unimpressive faint star. Distance the 15th is 1683 million miles.

NEPTUNE: fast approaching opposition in Virgo, it rises not long after sunset. It is well placed for observation, but is a still less inspiring sight than Uranus. Its disc can be detected with a magnification of 100 diameters, but is dull and grayish in color. Distance the 15th is 2740 million miles.

PLANETARY CONFIGURATIONS

Eastern Standard Time

MARCH 1955

Mar. 1—	2:	PM	Saturn sationary in Right Ascension
4—	5:04	AM	Conjunction, Jupiter and Moon; Jupiter north 2° 1′
4—	11:55	AM	Conjpnction, Uranus and Moon; Uranus north 2° 25′
6—	11:	PM	Mercury in descending node
10—	7:	PM	Mercury greatest elongation west, 27° 27′
11—	8:23	PM	Conjunction, Neptune and Moon; Neptune north 6° 37′
13—	5:07	PM	Conjunction, Saturn and Moon; Saturn north 5° 48′
16—	3:	PM	Jupiter stationary in Right Ascension
17—	6:	AM	Mercury in aphelion
20—	9:08	PM	Conjunction, Venus and Moon; Venus south 3° 56′
21—	4:36	AM	Sun enters Aries; Equinox
21—	Noon		Venus in descending node
22—	6:01	AM	Conjunction, Mercury and Moon; Mercury south 7° 9′
27—	5:34	AM	Conjunction, Mars and Moon; Mars south 2° 40′
31—	10:42	AM	Conjunction, Jupiter and Moon; Jupiter north 2° 17′
31—	4:49	PM	Conjupnction, Uranus and Moon; Uranus north 2° 37′

SOLAR AND SIDEREAL TIME

The Observer's Handbook

C. A. CHANT, *Editor*

The Royal Astronomical Society of Canada

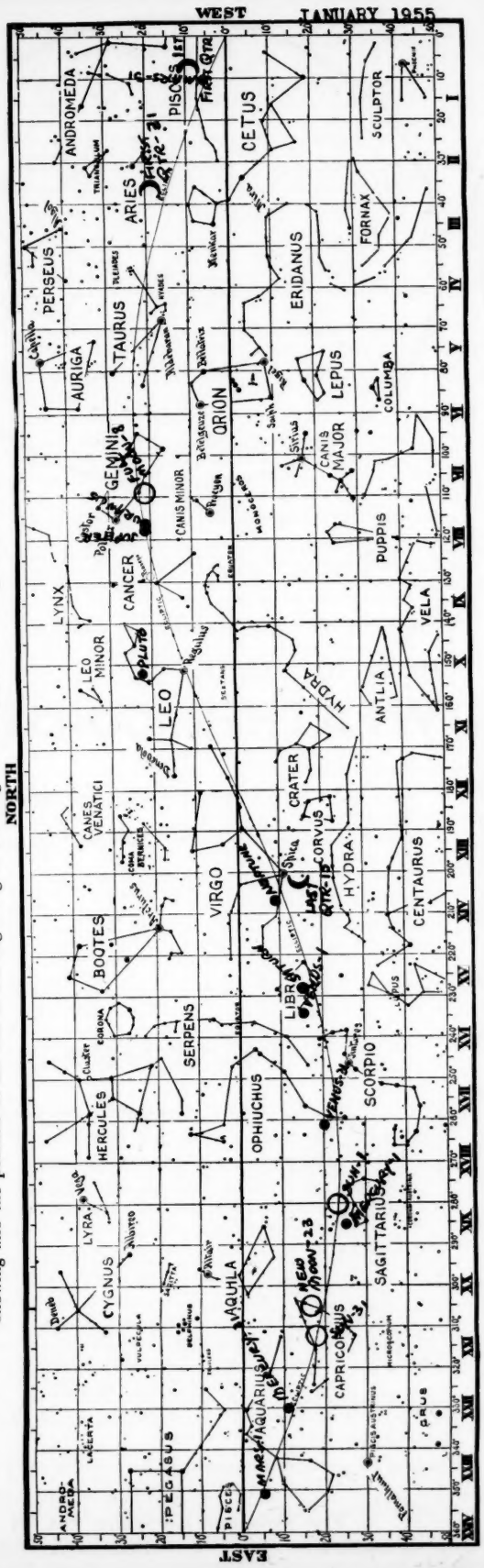
In practical astronomy three different kinds of time are used, while in ordinary life we use a fourth.

1. *Apparent Time*—By apparent noon is meant the moment when the sun is on the meridian, and apparent time is measured by the distance in degrees that the sun is east or west of the meridian. Apparent time is given by the sun-dial.

2. *Mean Time*—The interval between apparent noon on two successive days is not constant, and a clock cannot be constructed to keep apparent time. For this reason *mean time* is used. The length of a mean day is the average of all the apparent days throughout the year. The *real sun* moves about the ecliptic in one year; an imaginary *mean sun* is considered as moving uniformly around the celestial equator in one year. The difference between the times that the real sun and mean sun cross the meridian is the *equation of time*. Or, in general, *Apparent Time—Mean Time=Equation of Time*.

3. *Sidereal Time*—This is time as determined from the stars. It is sidereal noon when the Vernal Equinox or First of Aries is on the meridian. In accurate time-keeping the moment when a star is on the meridian

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50 DEGREES NORTH AND 65 SOUTH OF THE EQUATOR



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Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.

is observed and the corresponding mean time is then computed with the assistance of the National Almanac. When a telescope is mounted equatorially the position of a body in the sky is located by means of the sidereal time. At 0h. G.C.T. the Greenwich Sidereal Time= R.A. apparent sun + 12h. – correction to sun-dial (p. 7). Sidereal time gains with respect to mean time at the rate of 3m. 56s. a day or about 2 hours a month.

4. *Standard Time*—In everyday life we use still another kind of time. A moment's thought will show that in general two places will not have the same mean time; indeed, difference in longitude between two places is determined from their difference in time. But in travelling it is very inconvenient to have the time varying from station to station. For the purpose of facilitating transportation the system of *Standard Time* was introduced in 1883. Within a certain belt approximately 15° wide, all the clocks show the same time, and in passing from one belt to the next the hands of the clock are moved forward or backward one hour.

In Canada we have seven standard time belts, as follows: Newfoundland Time, 3h. 30m. slower than Greenwich; 60th meridian or Atlantic Time, 4 h.; 75th meridian or Eastern Time, 5h.; 90th meridian or Central Time, 6h.; 105th meridian or Mountain Time, 7h.; 120th meridian or Pacific Time, 8h.; and 135th meridian or Yukon Time, 9 h. slower than Greenwich.

Daylight Saving Time is the standard time of the next zone eastward. It is adopted in many places between certain specified dates during the summer.

THE SOLAR SYSTEM

Planet	Diameter (miles)	Distance from Sun (miles)	Time of Revolution
Mercury	3,100	36,000,000	88 days
Venus	7,700	67,200,000	225 days
Earth	7,913	93,000,000	365 days
Mars	4,200	141,500,000	686 days
Jupiter	88,700	483,300,000	11.86 years
Saturn	75,100	886,100,000	29.46 years
Uranus	30,900	1,783,000,000	84.01 years
Neptune	33,000	2,793,000,000	164.79 years
Pluto	6,000(?)	3,666,000,000	248.43 years

The equatorial diameters are given for Jupiter and Saturn.

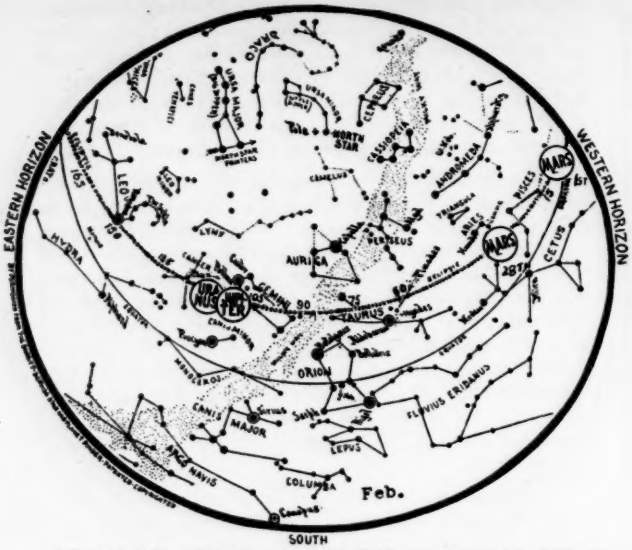
ELGER'S MAP OF THE MOON

This map shows Mountains, Craters, Seas, etc. We have been very fortunate in receiving these maps which are in such great demand. Due to the War these maps were unobtainable, now we have a limited quantity for immediate shipment to our subscribers. This map is printed on very heavy paper, cloth bound, actual size of the map is 18x18. If you are interested in one of the most fascinating subjects ("The Moon") surely you are not going to miss this opportunity of obtaining one of these maps.

PRICE $3.00 POSTPAID

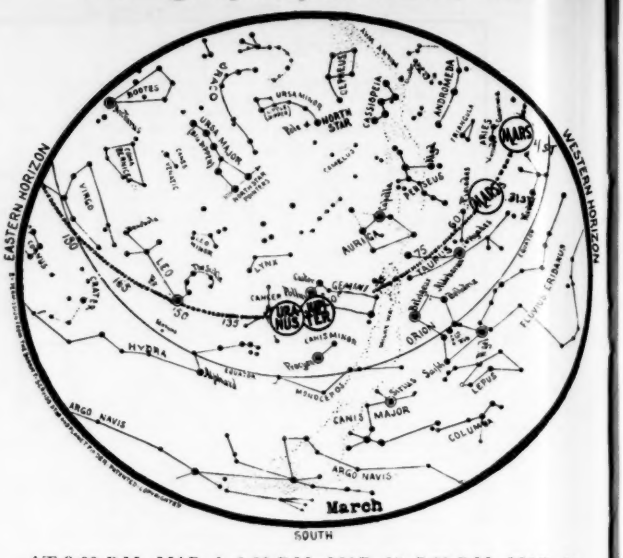
THE PUBLISHER OF THE MONTHLY EVENING SKY MAP will appreciate the kindly interest of its subscribers in sending the names of those whom they think to be interested in the study of the "STARS," we will take great pleasure in sending them sample copies.

Evening Sky Map for February, 1955



AT 9:00 P.M., FEB. 1; 8:00 P.M., FEB. 15; 7:00 P.M., FEB. 28

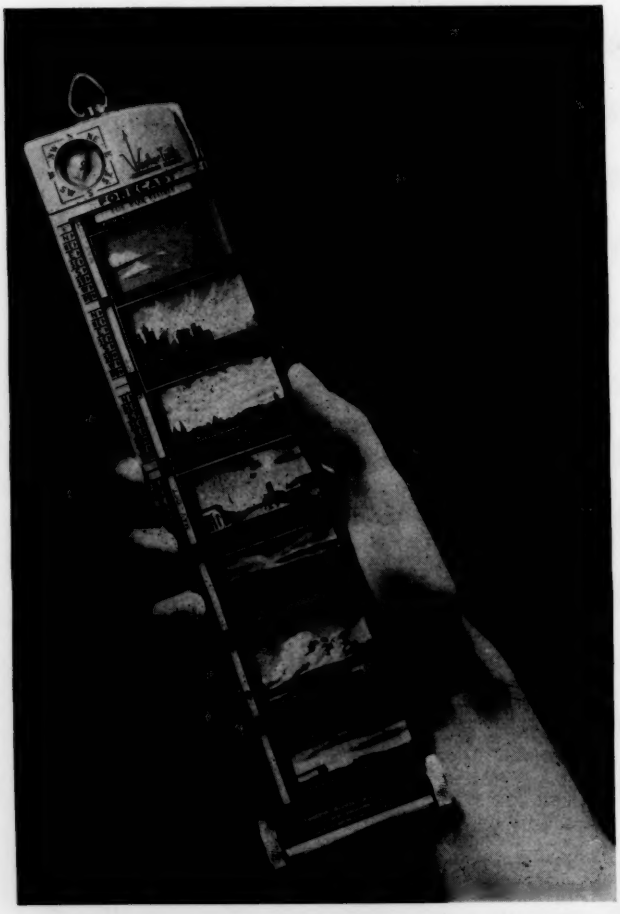
Evening Sky Map for March, 1955



AT 9:00 P.M., MAR. 1; 8:00 P.M., MAR. 15; 7:00 P.M., MAR. 28

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or South of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

WEATHER GUIDE



HOW TO USE THE
WEATHER GUIDE

1. Observe the entire sky.
2. Select cloud picture and description best matching your observation.
3. Find direction from which wind is blowing (use compass to locate north).
4. Turn arrow to this wind direction opposite selected cloud picture.
5. Read forecast.

A Lasting Gift For 365 Days

"The Monthly Evening Sky Map"

In selecting your gifts include a subscription to the Monthly Evening Sky May for your friends. It will bring them a year of intellectual pleasure, and lay the foundation for a life time of intelligent observation of the heavens in young people.

Available Until January 31, 1955

No. 1—Two years' subscription to the Monthly Evening Sky Map, $3.50; one Barritt's Star and Planet Finder with new book of Planet Table and Planet Disks, $7.00, one Barritts' Celestial Album containing 160 photographs, $5.00; one book, Romance of the Astronomers, $1.00, total $16.50. All can be obtained as a special gift to any of your friends for $10.00.

No. 2—Two years' subscription to The Monthly Evening Sky Map, $3.50; Barritt's Celestial Album, 160 photographs, $5.00; Romance of the Astronomers, $1.00; total $9.50. All can be obtained for Christmas, only $7.00.

No. 3—Barritt's Star and Planet Finder, with new book of Planet Tables, Planet Disks, and Moon Disks $7.00; two year's subscription to the Monthly Evening Sky Map, $3.50; Romance of the Astronomers, $1.00, total $11.50. All can be obtained as Christmas special for $8.00.

No. 4—Dr. Krick's New Weather Guide, $12.50; Three years subscription to the Monthly Evening Sky Map, $4.50; Total $17.00. Romance of the Astronomers, $1.00; All can be obtained for Special to subscribers, or as a gift to their friends $14.00.

This Weather Guide as Christmas Gift to any of your friends will positively be the most treasured gift, for many years, you will be remembered by them each and every day.

The *Weather Guide* is accurate any place in the Northern Hemisphere between 23° and 66° North Latitude, the belt normally referred to as the Temperate Zone. This includes all of the United States and most of Europe. The accuracy is made even higher by dividing the temperate zone into clamatic sectors, and preparing a separate instrument for each of these areas.

It should be emphasized that each instrument will produce highly accurate forecasts in all parts of the temperate zone, although its accuracy will be greatest in the area for which it is designated. When ordering your *Weather Guide*, specify the area for which it is desired. NORTH WEST, or SOUTH WEST, NORTH CENTRAL, or SOUTH CENTRAL, GREAT LAKES, NORTH EAST or SOUTH EAST.

PLEASE SEND YOUR ORDERS "NOW" so that your Christmas Gifts may be delivered on time, Since there is quite a demand for these Weather Guides as Christmas Gifts, be sure to order yours at once.

THE WINTER NIGHT SKY

First the Pleiades, twinkling bright,
Greet us on a winter night.
Bold Taurus, with his flaming eye,
Races across the darkening sky.
Orion next, above the trees,
Outshines the rest and takes his ease.
He waits for Sirius, Great Dog star,
Blazing, glowing from afar.
Glorious, sparkling, wondrous sight
The beauty of a winter night.

—Alazuma J. Singmaster.

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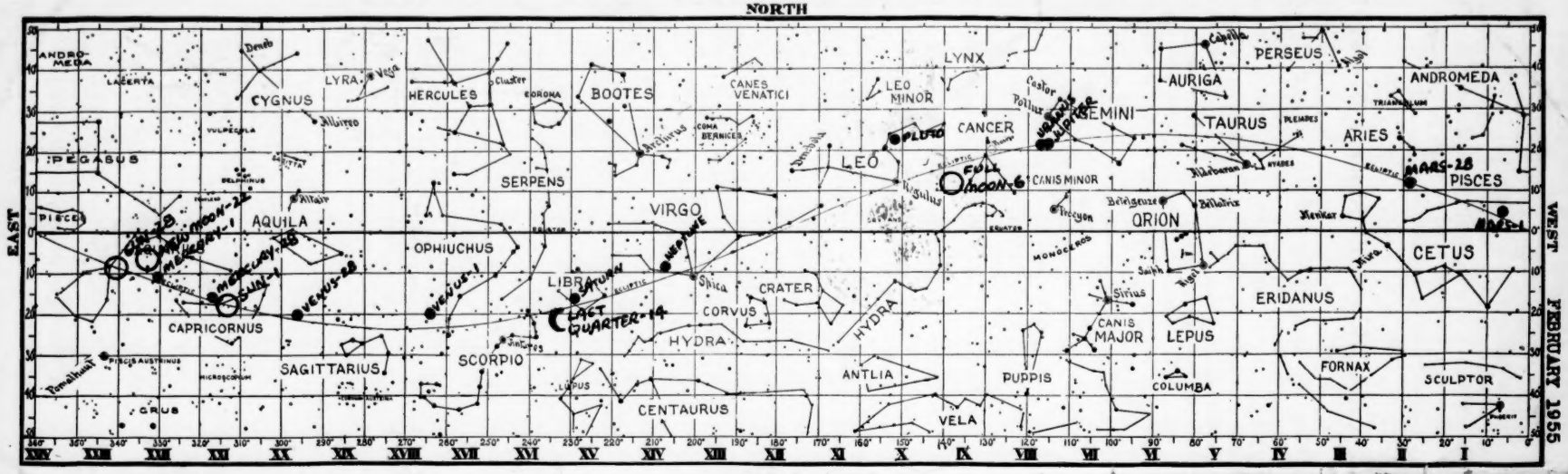
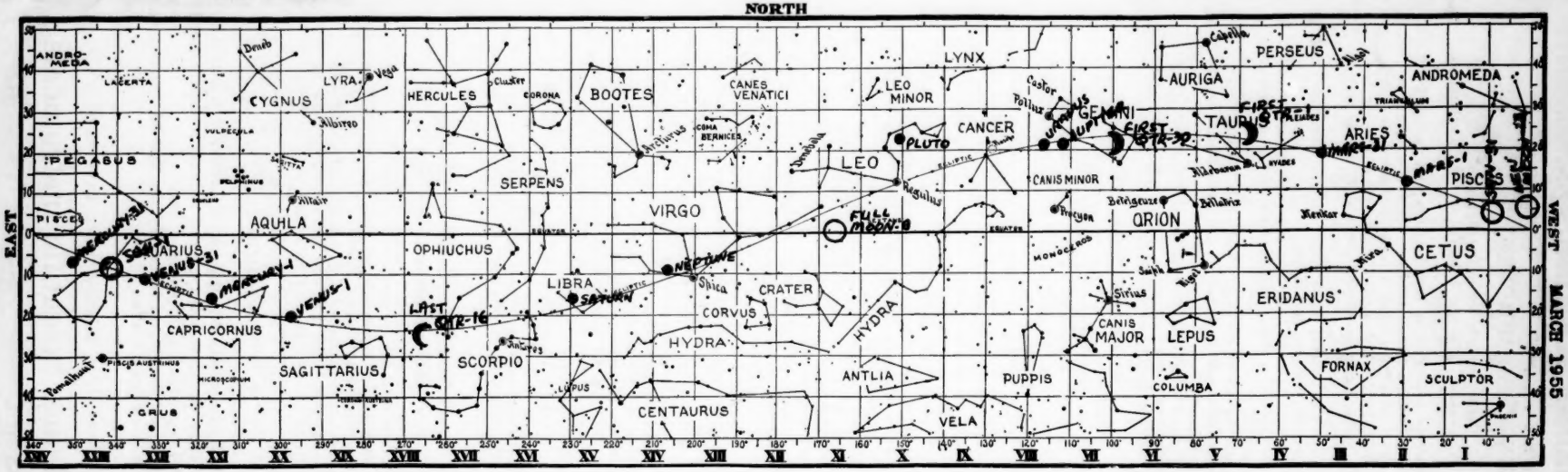
NORTH



NORTH



Nov. 5 Oct. 22 Oct. 5 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 June 5 May 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20

THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDIAN—DUE SOUTH—AT 9 P.M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.